International Mortgage Markets: Products and Institutions

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1 Introduction

The primary focus of this document is to quantify variables that capture different aspects of contract characteristics, supply-side factors and institutional details of international mortgage markets. We collect and describe the data from secondary sources, for the 14 countries in the sample of Badarinza, Campbell, and Ramadorai (2014).

Prior cross-country studies of mortgage market characteristics (in particular Lea, 2010) describe cross-country variation in mortgage market characteristics in a predominantly qualitative fashion, and do not contain the kind of data that is suitable for inclusion in a quantitative empirical study. Our aim is to uncover data (from secondary sources) which can accurately capture cross-sectional and time-series variation in these characteristics.

The principal challenges encountered in this quantification exercise are as follows. First, there is a lack of availability of comparable variables measuring the aspects of contract characteristics and supply-side factors that we are interested in, since no entity in the public domain has so far attempted to classify and assemble such data. Second, since measures of the same (or similar) variables may be obtained from different sources for different subsets of the sample, inconsistencies may arise in methods used to construct the relevant variables. An extreme case of this phenomenon is seen in the section on securitization rates, where the fact that securities issuance and lending volumes have been obtained from different sources leads to logical inconsistencies in the data. Finally, several sources of data on these characteristics have limited coverage of the countries in the sample, and/or omit coverage of particular variables at various points in time.

Table 1 provides an overview of the limitations affecting the data collection exercise. Some aspects of contract characteristics and supply-side factors were simply not amenable to quantification, and in these cases, potential proxy variables are discussed. Throughout the tables in this report, cells which are left blank indicate that data was unavailable, and cells containing a hyphen (-) indicate inappropriate or logically inconsistent data which has been censored.

2 Contract Characteristics

The variables in this section attempt to capture elements of mortgage contract characteristics that may affect household mortgage choice. The variables that we attempt to quantify under this category are (1) regulations governing maximum loan-to-value (LTV) ratios, (2) foreclosure rules, (3) bankruptcy proceedings, and (4) prepayment penalties. Prepayment penalties are of particular interest as we would expect the presence, absence, and extent of these to have an effect on the choice of fixed-rate (FRM) versus adjustable-rate mortgages (ARM).

In the absence of prepayment penalties on FRMs (especially long-term FRMs), the call option value of holding an FRM becomes more relevant, as they can be refinanced when rates fall. The call option value embedded in FRMs represents a cost to lenders, and is likely to have an impact on FRM rates.

Conversely, a stricter prepayment penalty system, might diminish this FRM option value by making refinancing more costly, or in some cases impossible, potentially making ARMs relatively more attractive. We report data on each of these aspects of contract characteristics in Tables 3 to 5.

2.1 Maximum LTV ratios

Data on the maximum LTV ratio have been used by three main strands of the literature. First, the comparative studies of mortgage markets across countries, e.g. Mercer Oliver Wyman and EMF (2003), ECB (2009), IMF (2011), Warnock and Warnock (2008)), tend to report cross-sectional averages but no time-series dynamics for the maximum LTV ratio.

Second, empirical macroeconomic studies that use maximum LTV ratios as a measure of liquidity constraints, e.g. Jappelli and Pagano (1989, 1994), Chiuri and Jappelli (2003), Almeida et al. (2006), report time-series variation in the maximum LTV ratio only on a decade-by-decade basis and their coverage usually extends only until the 1990s. Official maximum LTV ratios are usually set by regulators for an extended duration, and are generally speaking not an active policy instrument (except very recently, or in emerging markets, as we discuss below).

For more recent data, we turn to a third set of studies on the use of maximum LTV ratios and other financial regulations by central banks as instruments for macro-prudential policy, e.g. Crowe et. al (2011).

In Table 2, we report the maximum LTV ratios for the countries in our sample over a period commencing in 1980, until the most recently available figures. These are obtained from the secondary sources mentioned above. We have included the sources which have the greatest coverage of the countries in our sample—in general, we prefer sources with the maximum cross-country coverage and lowest amount of ambiguity in values (i.e. a single value as far as possible instead of a range, or a minimum bound). More often than not, we use data from Almeida et al. (2006) for the 1980s and 1990s, and Crowe et al. (2011) for the 2000s.

2.2 Foreclosure rules and bankruptcy provisions

While we expect foreclosure rules and bankruptcy provisions to vary considerably across the countries in the sample, it is a challenge to come up with easily quantifiable variables representing these rules and provisions due to their inherent complexity and idiosyncratic features. Instead, we have chosen to report data (which were more readily available and quantifiable), on the efficiency of the foreclosure process. In particular, we refer to the typical duration of a foreclosure procedure, measured in months.

There is considerable variation in this variable across the countries in our sample. Overall, we believe that this is a reasonable proxy for the relative flexibility and efficiency of the foreclosure and bankruptcy provisions, and the institutions enforcing them. We expect that a more inefficient procedure for foreclosure or bankruptcy (longer duration or higher cost), is likely to be correlated with the relative ease and flexibility with which this can be done in a given country, in practice. We report the corresponding data in Table 3.

2.3 Prepayment penalties

The relative attractiveness of FRMs over ARMs is partially a function of the inherent call-option value of an FRM. This represents a benefit to borrowers, and a cost to lenders. Lenders often attempt to recover this by charging prepayment penalties. If a complete yield maintenance penalty is charged, this effectively reduces the option value of FRMs to zero. However, for the purposes of consumer protection, regulators in several countries mandate statutory limits on the type and amount of prepayment penalties that lenders are permitted to charge. A reasonable approximation is that stronger consumer protection generally leads to lower prepayment penalties, and greater FRM option value.

However, quantifying prepayment penalties, and limits on them has proven to be difficult. First, prepayment penalties are often built into each individual contract with terms linked to other specific details of the contract, for example loan maturity or amortization schedule. This severely complicates the computation of a single aggregate measure for each country. This problem is compounded by the presence of significant variation in prepayment penalties across lenders as well as loan varieties within a given country.

Second, regulations on the charging of prepayment penalties are often vague, and not amenable to quantification. For example in Germany, the regulation consists of a formula to be used in computing the lost interest income for the lender (European Commission, 2009).

Third, both the regulations regarding the levying of prepayment penalties, and the typical prepayment penalties themselves, are specified in different units in different countries. Regulations can be of the form of (1) a volume limit on the number of interest payments that can be charged as penalty, the percentage of the loan, or the percentage of the amount prepaid that can be charged as a penalty, or (2) the stipulation of certain qualitative conditions under which penalty cannot be charged (e.g. death or financial hardship). Some countries also mandate a certain threshold period (e.g. first 10 years), or a certain percentage of the loan value per year, up to which penalty-free prepayment can be made. Accordingly, influenced by regulation, the prepayment penalties themselves are stated in different terms across countries (e.g. referring to yield maintenance, the specified number of interest payments, percentage of loan value, percentage of value prepaid, as well as stipulations for penalty-free prepayment).

The prepayment penalty system in a country is often a composite of several of the above-mentioned features. This further complicates our attempt to obtain a single, quantifiable measure of the extent of prepayment penalties, as well as any limits on prepayment penalties that exist in a given country.

In spite of these difficulties and the general lack of availability of country-level data on prepayment penalties, we propose a synthesis of the available information below. Overall, the information on prepayment penalties and regulations on prepayment penalties gathered from a large and varied set of sources appears to be largely consistent. This may be an indication of the reliability of the information, despite the considerable heterogeneity of product characteristics.

The broad summary of prepayment penalties and regulations is presented in Table 4.

In Table 5 we classify the idiosyncratic prepayment penalties and regulations in each country, and group them under a few broad categories. In these tables, the heading "Unclear" refers to the fact that a clear-cut classification to FRMs, ARMs, or both is not apparent in the information contained in the secondary sources that we analyzed.

In Table 6, we report estimated prepayment option premia. According to Lea and Sanders (2010), a harsher prepayment penalty system (i.e. higher penalties, with the highest being full yield maintenance) is one in which the prepayment risk is borne by the individuals who decide to prepay, rather than paid by all mortgage holders via higher interest rates. They also infer that harsher prepayment penalties should be associated with smaller prepayment option premia—leading them to believe that prepayment option premia may be reasonable proxies for how harsh the prepayment penalty system is.

3 Supply-side factors

The variables in this section capture elements of the supply-side variation in mortgage markets across the countries in our sample, and over time (where possible). The variables in this section concern the financing

of mortgages, namely the extent to which mortgages in various countries are financed via securitization, specifically mortgage backed securities (MBS), or covered bonds.

First, in Tables 7 and 8 we report the volume of issuance of covered bonds and MBS respectively. Then, in Tables 9 and 10, we divide these numbers by total mortgage lending volume to obtain the the covered bond issuance ratio, and the securitization ratio, which measure the share of new lending financed by MBS and covered bonds respectively in each year.

Our data on issuance of covered bonds and MBS is obtained from a different source than data on lending volumes. Issues with currency conversion at the data sources may also contribute to inconsistencies, as data from the ECBC and EMF is all reported in Euros or ECUs, whereas the lending volume was converted manually to Euros. Furthermore, for the majority of European countries, issuance data on MBS and covered bonds is obtained through the EMF and the ECBC, whose datasets are incomplete and contain major omissions. Further work will be required to fill these gaps, and obtain better data for the remaining countries (e.g. covered bonds and MBS issuance, as well as lending volumes), such as to yield a complete set of logically consistent securitization and covered bond issuance ratios. For now, we deal with measurement inconsistencies for some of the countries in the sample, which yield logically implausible values for the securitization and covered bonds issuance ratios, by simply reporting issuance volumes. Cells marked with a hyphen (-) indicate logically inconsistent values, and cells which are blank indicate missing data.

Securitization rates for the US can be obtained from Inside Mortgage Finance, which provides direct calculations of ratio of securitization volumes and lending values. However, similar sources seem not to be available for the other countries in our sample.

Table 1

Summary of variables and data availability

This table contains a summary of the availability of data on the variables of interest, for the countries in the sample. The countries are ordered in descending order of number of variables for which data is available for the given country. Green cells indicate that data is available, and red cells indicate data is unavailable. Under the column "LTV", we indicate whether the value for maximum LTV ratio (either mandated if a statutory limit exists, or maximum observed value if no such limit exists) is available, for each country. Under "Bankruptcy", we consider whether the data on typical duration of foreclosure procedure is available. Under "Prepayment Penalty", we consider whether data on the institutional features of prepayment penalties are available, and whether the prepayment option premium value is available. Under the "Issuance" columns, we record whether the volume of issuance is available, and whether the annual time-series is complete for 2003-2012, and 2008-2012. Under the "Share" columns, we report for each country, whether a logically consistent (less than or equal to 100%) value is given, alongside a complete annual time-series from 2008-2012 (in the case of covered bonds) and 2009-2012 (in the case of RMBS).

Country	LTV Maximum			Bankruptcy	Prepayment Penalty		CB Issuance				RMBS Issuance				CB Share			RMBS Share		
	1980	1990	2000	Foreclosure duration	Institutional features	Option premium	Start	End	Complete 2003-12	Complete 2008-12	Start	End	Complete 2003-12	Complete 2009-12	Start	End	Complete 2008-12	Start	End	Complete 2009-12
Germany	1	1	1	1	1	1	1991	2012	1	1	2002	2010	0	0	2003	2012	1	2003	2006	0
Italy	1	1	1	1	1	1	1991	2012	0	1	1999	2012	1	1	2005	2011	0	2003	2011	0
Netherlands	1	1	1	1	1	1	1991	2012	0	1	1996	2012	0	1	2005	2012	1	2009	2012	0
Spain	1	1	1	1	1	1	1991	2012	1	1	1993	2012	0	1	2003	2010	0	2009	2012	1
UK	1	1	1	0	1	1	2003	2012	1	1	1991	2012	0	1	2003	2012	1	2002	2012	1
Belgium	1	1	1	1	1	0	2012	2012	0	0	1997	2012	0	1	2012	2012	0	2003	2012	1
Denmark	1	1	1	0	1	1	1991	2012	1	1	2005	2005	0	0	-	-	0	2005	2005	0
Finland	1	1	1	1	1	0	1991	2012	0	1	1999	2004	0	0	2005	2012	1	-	-	0
Ireland	1	1	1	1	1	0	2004	2012	0	1	1996	2012	0	0	2004	2012	1	2003	2012	0
Portugal	0	0	1	1	1	1	1996	2012	0	1	2009	2012	0	1	2006	2009	0	2009	2012	1
US	1	1	1	0	1	1	2006	2007	0	0	1999	2012	1	1	2006	2007	0	0	0	0
Sweden	1	1	1	0	1	0	1991	2012	0	1	2001	2004	0	0	2006	2007	0	2001	2004	0
Australia	1	1	1	0	0	0	2011	2012	0	0	-	-	0	0	-	-	0	-	-	0
Greece	0	0	0	1	1	0	2008	2011	0	0	2003	2012	0	0	2008	2009	0	2003	2009	0

Table 2
Maximum LTV ratios

This table reports the maximum allowable Loan-to-value (LTV) ratio where such a limit is statutory. In some countries there is no statutory maximum LTV ratio. In such cases we report in place of the maximum LTV ratio, the maximum observed average LTV ratio in the decade. Values above 100% LTV were observed in the UK and Netherlands prior to the crisis of 2008. Only recently, in 2012, has a limitation of 100% been discussed in the Netherlands[1]. Blanks indicate unavailable data.

	Max		Max
	1981-1990	1991-2000	2000-2007
Australia	80	80	95
Belgium	75	80	100
Denmark	95	80	80
Greece			
Ireland	90	80	100
Italy	56	60	80
Netherlands	75	75	125
Sweden	95	75	100
United States	89	80	100
Finland	85	80	100
Germany	65	80	80
Portugal			90
Spain	80	80	100
UK	87	95	110
Sources:	*Almeida et al. (2006) pp. 10*		*Crowe et al. (2011) pp. 46*

Table 3
Efficiency of foreclosure procedures

The duration of foreclosure procedures (in months) refers to the average duration taken for the completion of the foreclosure procedure including completion of court proceedings, sale of the asset, and distribution of proceeds to the creditors (National Bank of Belgium, 2013). Other variables referring to the bankruptcy proceedings are omitted due to questionable reliability, and lack of consistency with other sources. Blanks indicate unavailable data.

	Typical duration of a foreclosure procedure (in months)
Australia	
Belgium	19
Denmark	
Greece	24
Ireland	19
Italy	56
Netherlands	5
Sweden	
United States	
Finland	4
Germany	9
Portugal	24
Spain	8
UK	
Sources:	*National Bank of Belgium (2013) pp. 49*

Table 4
Overview of prepayment penalties

This table gives a summary of the cross-country variation in the existence of prepayment penalties (and where available, whether they apply to FRMs or ARMs). Under "Existence of penalty" we note whether prepayment penalties exist, and in the case where '0' is indicated, this refers to the fact that either it is forbidden to collect prepayment penalties by statute, or it is common practice in the market to not charge prepayment penalties. Where available, we specify the form and type of prepayment penalty charged, and the conditions under which penalty-free early repayment can be made. '1' and '0' are dummy variables denoting presence and absence of a given item. Finally, under "Limits on penalty", we denote whether there exist either statutory limits for the purpose of consumer protection, or common market practices, that limit the extent of prepayment penalties that can be charged. Volume limit refers to a restriction that prepayment penalty cannot exceed a certain volume, either percentage of outstanding balance, or percentage of amount prepaid, or certain number of monthly payments. Blank spaces indicate unavailable data. The term "Unclear" codifies the fact that it is unclear whether this item applies to FRM, ARM or both.

	Existence of penalty			Type of penalty[2]			Conditions for penalty free prepayment[3]			Limits on penalty		
	FRM	ARM	Unclear	FRM	ARM	Unclear	FRM	ARM	Unclear	FRM	ARM	Unclear
Australia	1			Yield maintenance								
Belgium	1						Death			Volume limit		
Denmark[4]	1 for non callable; 0 for callable			Yield maintenance for non callable; None for callable			Implicit for non callable			None for non callable		
Greece			1									Volume limit
Ireland	1	0										
Italy	1	1		1-2% of prepaid value	1-2% of prepaid value					Informal cap of 5%	Informal cap of 5%	Yield maintenance prohibited
Netherlands	1			Yield Maintenance			Hardship, relocation, 10% per year penalty free			10% per year penalty free		
Sweden		1										
United States	0	1			Usually less than 5%, approx 3%			20% per year penalty free				
Finland	1	1			Yield maintenance		0			None		
Germany	1	0		Yield maintenance			If property sold, relocation, if lender refuses request to increase mortgage			Only in first 10 years can fees be charged, 10% per year penalty free		
Portugal			1			2%			25% per year pnealty-free			
Spain	1	1		2.5-5% of residual balance	0.5% of residual balance		10% per year free	10% per year free		cap of 4%, informal cap 2.5%	cap of 1%	
UK	1	1		2-5% of prepaid value						No definite limit, case by case		
Sources:	*Lea (2010), Schafer (2006) pp. 5-7, Mercer Oliver Wyman (2003) pp. 42, European Commission (2009) pp. 204-211, O'Reilly (2000) pp. 21*											

Table 5
Institutional features of regulations on prepayment penalties

In this table, we classify the institutional features of consumer protection regulations on prepayment penalties, including their existence, and type. '1' and 'o' are dummy variables denoting presence and absence of a given item. Blank spaces indicate unavailable data. "Unclear"' codifies the fact that it is unclear whether this item applies to FRM, ARM or both. The first two columns denote the existence of statutes (or commonly agreed market practices) that limit the volume of prepayment penalty that can be charged, either as a percentage of outstanding balance, or a specific number of monthly payments. The next three columns give details on the circumstances under which penalty free prepayment can be made (once again, either mandated or by common practice), including exigent circumstances like death and unemployment, or the lapse of a certain time period (for instance, charging penalties may be forbidden when a loan gets closer to maturity), or whether there is a certain percentage of balance that can be repaid early, penalty-free. The final column indicates whether there exists a prescribed definition of the nature of loss against which lenders can claim a prepayment penalty (for instance, as in Germany for FRMs and in other countries, where prepayment penalties can only be charged in order to compensate for lost interest income).

	Upper limit on prepayment charges						Conditions for penalty-free prepayment									Definition of the loss for which fee is charged, and calculation of the charge		
	% of outstanding balance			Specific number of monthly payments			Death, unemployment, relocation, excessive interest			Lapse of certain time period			Up to certain % of mortgage value					
	FRM	ARM	Unclear	FRM	ARM	Unclear	FRM	ARM	Unclear	FRM	ARM	Unclear	FRM	ARM	Unclear	FRM	ARM	Unclear
Australia																		
Belgium				1			1											
Denmark	0			0			0			0			0					
Greece			1			1			1									1
Ireland		1			1								1			1		
Italy	1	1																
Netherlands	0						1			1			1			1		
Sweden																	1	
United States	0			0										1				
Finland																	1	
Germany							1						1			1		
Portugal			1						1			1						
Spain	1	1								1			1	1			1	
UK	0	0		0	0													
Sources:	*Lea (2010) pp. 21-23, Scahfer (2006) pp. 5-7, European Commission (2009) pp. 204-211*																	

Table 6
Prepayment option premia

This table reports estimated counterfactual mortgage rates which are free of prepayment risk, as well as the corresponding prepayment option premium. Harsher prepayment penalties are correlated with lower prepayment option premia, since in those cases the prepayment risk can be individualized and not reflected in higher overall rates. Only when lenders cannot reclaim their losses by charging penalties from borrowers, due to existence of strong regulations or market practices in favour of consumer protection, do we expect the option premium to be large, and have a positive impact on mortgage rates.

	Average interest rate with prepayment risk	Prepayment option premium	Average interest rate without prepayment risk	Price increase due to prepayment option
Australia				
Belgium				
Denmark	5.19%	0.46%	4.73%	10%
Greece				
Ireland				
Italy	4.73%	0.2%	4.53%	4%
Netherlands	4.55%	0.2%	4.35%	5%
Sweden				
United States		0.5%		
Finland				
Germany	4.84%	0.06%	4.78%	1%
Portugal	3.58%	0%	3.58%	0%
Spain	3.55%	0%	3.55%	0%
UK	4.88%	0.01%	4.87%	0%
Source:	*Dubel (2005) pp. 27, US from Lea and Sanders (2011) pp. 228*			

Table 7
Issuance of mortgage covered bonds (in EUR millions)

Blanks refer to unavailable data, hyphens refer to unreliable data which require further investigation.

Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Australia																					2142	34902
Belgium																						2590
Denmark	11918	11704	30924	37656	20535	30983	33926	56546	53122	36618	69844	76063	99727	95009	149708	114014	70955	103230	125484	148475	145147	185845
Greece																		5000	1500	17250	5000	
Ireland														2000	2000	7753	1675	9506	14801	6000	9290	5500
Italy	20946	16083	23126	21743											4000	4063		6500	7500	12925	29261	70768
Netherlands	197	159	301	298	286	626	296	341		-		-			2000	6732	7873	5608	7725	13710	14163	10738
Sweden	16885	19982	24783	23868	15668	18444	24027	26107	235545	22192	23652	25590				17569	36638	43488	53106	79910	69800	48936
United States																-	-					
Finland	810	251	169	262	125	253	349	177						250	1250	1500	1500	1250	2125	5250	9964	9368
Germany	12679	21904	35300	38168	38255	36311	41596	50000	46575	49553	44013	40857	57621	40773	33722	35335	26834	57345	56852	42216	40911	38540
Portugal						-	-									2000	5850	7020	7250	11870	9300	4850
Spain	1954	1433	2350	1940	2881	2061	2194	1472	5235	2530			28502	37835	57780	69890	51801	54187	43580	51916	72077	98846
UK													5000	10688	12675	25813	31673	120906	33870	25900	36983	37109
Source:	*ECBC (2013)*																					

Table 8
Issuance of mortgage-backed securities (in EUR millions)

Blanks refer to unavailable data, hyphens refer to unreliable data which require further investigation.

Issued MBS	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Australia																						
Belgium							-			-	-		2270	1050					19100	11400	19000	4700
Denmark															-							
Greece													250	741	1500	3600	2805		1400		1700	1300
Ireland						254		508	1150	1645	2014		1820	2000	2000	7900	1675	9500	13700	4200		900
Italy									275	1510	8085	6578	8871	7417	9850	16946	22267	75735	53200	10000	8800	31700
Netherlands						229	1380	914	3837	7406	9171	17611							40800	125000	83400	34200
Sweden											280	1470	1000	1513								
United States									722774	576170	1379448	1787578	2186913	1161748	1373933	1282695	1239326	817313	1249954	1080138	891802	1346673
Finland									177					500								
Germany												-	-	-	-	-			-	-		
Portugal																			8700	9400	1300	1600
Spain			232	519	686	108	702	3871	5932	3059	4230	11470	15910						26300	17800	14100	2500
UK	3279	522	1347	2963			2906	3334	8245	22650	25470	35270	55460	79773	103311	202823			62300	87900	77900	38700
Source:	*ECBC (2013), EMF (2012), SIFMA (2014)*																					

Table 9

Mortgage covered bond issuance as a share of total mortgage lending volume

Blanks refer to unavailable data, hyphens refer to unreliable data which require further investigation.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Australia										
Belgium										0.094
Denmark	-	-	-	-	-	-	-	-	-	-
Greece						0.402	0.188	-		
Ireland		0.074	0.047	0.129	0.0265	0.235	0.490	0.251	0.597	0.511
Italy			0.064	0.060		0.108	0.138	0.222	0.551	-
Netherlands			0.019	0.063	0.010	0.077	0.146	0.216	0.193	0.197
Sweden				0.497	0.974	-	-	-	-	-
United States				-	-					
Finland			0.048	0.056	0.052	0.047	0.108	0.250	0.442	0.432
Germany	0.328	0.262	0.197	0.188	0.148	0.325	0.291	0.228	0.213	0.200
Portugal				0.109	0.298	0.525	0.777	-	-	-
Spain	0.276	0.309	0.374	0.410	0.356	0.622	0.596	0.747	-	-
UK	0.0125	0.025	0.030	0.051	0.060	0.379	0.210	0.164	0.227	0.210

Table 10

Mortgage backed securities issuance as a share of total mortgage lending volume

Blanks refer to unavailable data, hyphens refer to unreliable data which require further investigation.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Australia												
Belgium			0.122	0.067					0.912	0.398	0.690	0.171
Denmark					0.001							
Greece			0.042	0.092	0.110	0.233	0.185		0.176			
Ireland			0.054	0.074	0.047	0.131	0.026	0.235	0.455	0.174		0.084
Italy			0.201	0.142	0.158	0.250	0.320	-	0.978	0.171	0.164	-
Netherlands									0.768	-	-	0.627
Sweden	0.016	0.078	0.0423	0.055								
United States	-	-	-	-	-	-	-	-	-	-	-	-
Finland												
Germany			-	-	-	-						
Portugal									0.932	0.930	0.268	0.569
Spain			0.154						0.360	0.257	0.376	0.077
UK		0.100	0.138	0.186	0.245	0.400			0.437	0.557	0.479	0.219

Notes

[1]For details, see "Mortgage Markets in the Netherlands" ABN AMRO, May 2012, and Netherlands Financial System Stability Assessment, IMF, May 2011.

[2]Yield Maintenance refers to the idea that a prepayment penalty is charged in order to compensate the lender fully for the lost of yield due to refinancing at a lower rate, rendering the same yield as if the borrower made all scheduled mortgage payments until maturity at the original rate.

[3]Penalty free payments may be permitted, either by law or by common understanding amongst lenders under certain conditions. These conditions include, but are not limited to, death, hardship, relocation, sale of property, or a certain percentage of balance that can be prepaid for free every year.

[4]In the Danish mortgage market, each mortgage is financed by a mortgage bond linked specifically to it. These bonds are of two types, callable and non-callable. Callable bonds are enabling the borrowers to prepay their loan at par at each payment date during the duration of the loan, by purchasing and delivering the bond to the lender. The non-callable bond is similar to fixed-rate mortgage bonds in most European countries, and do not carry an embedded call option. As a result, prepayment penalties are charged that allow investors to attain the same yield as if the borrower made all scheduled mortgage payments until maturity, otherwise known as yield maintenance (*"Danish Mortgage Bonds"*, Realkredit Danmark, September 2008). There are no limits on the penalty that can be charged for non-callable bonds.